

Use Attainability Analysis

for

WBID 0833 Linn Creek

Submitted by
SES, Inc.

To
Missouri Department of Natural Resources
Water Protection Program

Date Received: September 10, 2007

Field Data Sheets for Recreation Use Stream Surveys
Data Sheet A - Water Body Identification
(For water body being surveyed)

Water Body Information

Water Body Name:	Linn Creek	WBID:	833
8 digit HUC code:	10300102	County:	Osage
Upstream Legal Description	T43N	R8W	Sec 20
Downstream Legal Description	T44N	R9W	Sec 13
Number of Sites Evaluated	4		
List all site numbers, listed upstream to downstream 4 3 2 1			

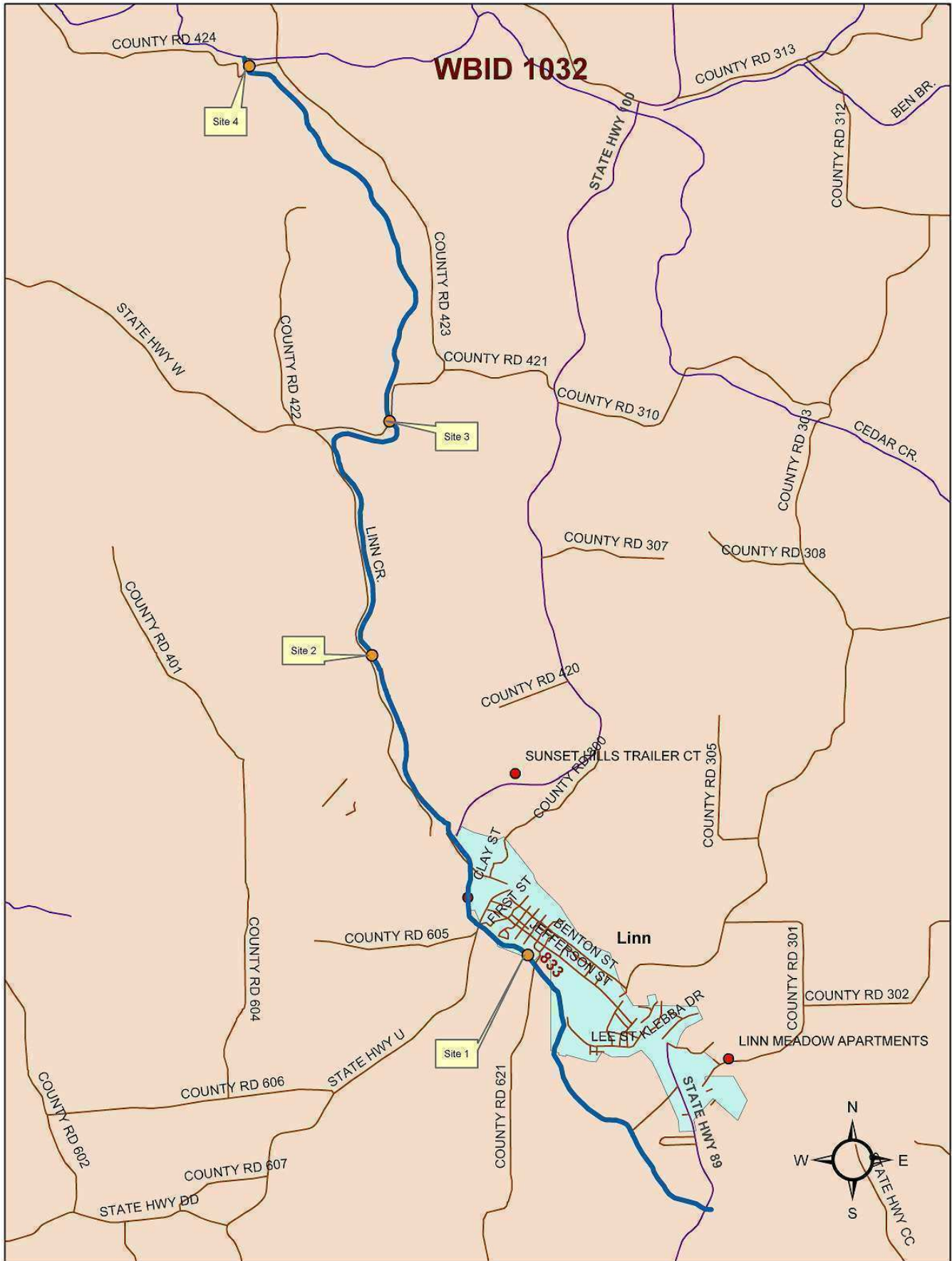
Discharger Facility Information

Discharger Facility Name(s):	LINN WWTF
Discharger Permit Number(s):	MO00515 51

UAA Surveyor

Name of Surveyor:	Aaron Ball	Telephone Number:	913.307.0054, Ext.14
Organization/Employer: SES, Inc.			
Position: Field Team Leader			

Signed: _____ Date: _____



Field Data Sheets for Recreational Use Stream Surveys
Data Sheet B - Site Characterization
(must be completed for each site)

WBID 833
 Site # 1

Date and Time: 8.01.07 1:20pm

Current Weather Conditions clear

Weather Conditions for Past 10 days: clear

Drought Conditions? No

Site Location (e.g. road crossing) County Road 621

GPS Mark: 13

Upstream Photo 14 Downstream Photo 15

Uses Observed (Uses actually observed at time of survey) Circle

Swimming	Skin Diving	SCUBA diving	Tubing
Water Skiing	Wind Surfing	Kayaking	Boating
Wading	Rafting	Hunting	Trapping
Fishing	<u>None of the Above</u>	Other	

Surrounding Conditions

<u>City/county parks</u>	Playgrounds	MDC conservation lands	Urban areas
Campgrounds	Boating accesses	State parks	National Forests
Nature trails	Stairs/walkway	No trespass sign	Fence
Steep slopes	None of the Above	Other	

Indications of Human Use

Roads	Rope swings	Foot paths/prints	Dock/platform
Livestock Watering	RV/ATV Tracks	Camping Sites	Fire pit/ring
NPDES Discharge	Fishing Tackle	Other:	

WBID # 833 **Site #** 1
Mark # 13 **Dissolved Oxygen (ppm)** N/A
Upstream Views Physical Dimensions: Is there any water present at this view? no

If so, is there an obvious current?

Select one of the following channel features:

	% of Channel Feature				
Riffle	27				
Run	45				
Pool	28				

Downstream View's Physical Dimensions: Is there any water present at this view? no

If so, is there an obvious current?

Substrate:

27% Cobble	50% Gravel	% Sand	% Silt
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% Mud/Clay	23% Bedrock
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Aquatic Vegetation: (Note amount of vegetation or algal growth at the assessment site)

none

Water Characteristics

Odor	Sewage	Musky	Chemical	None	Other
Color	Clear	Green	Gray	Milky	Other
Bottom Deposit	Sludge	Solids	Fine Sed.	None	Other
Surface Deposit	Oil	Scum	Foam	None	Other

Data Sheet C: Cross-Sectional Depth Measurements (for estimation of median depth)
(Median Depth Shown in Bold)

Site # 1

Mark # 13

WBID# 833

	Depth (m)		Depth (m)		Depth (m)
Transect 1	0.00	Transect 5	0.00	Transect 9	0.00
Substrate:	0.00	Substrate:	0.00	Substrate:	0.00
bedrock	0.00	bedrock and gravel	0.00	cobbly gravel	0.00
Water Clarity:	0.00	Water Clarity:	0.00	Water Clarity:	0.00
N/A	0.00	N/A	0.00	N/A	0.00
Channel Feature:	0.00	Channel Feature:	0.00	Channel Feature:	0.00
run	0.00	riffle	0.00	riffle	0.00
Channel Width:	0.00	Channel Width:	0.00	Channel Width:	0.00
6 yards	0.00	4 yards	0.00	7 yards	0.00
0.00	0.00	0.00	0.00	0.00	0.00
Transect 2	0.00	Transect 6	0.00	Transect 10	0.00
Substrate:	0.00	Substrate:	0.00	Substrate:	0.00
bedrock and gravel	0.00	cobbly gravel	0.00	cobbly gravel	0.00
Water Clarity:	0.00	Water Clarity:	0.00	Water Clarity:	0.00
N/A	0.00	N/A	0.00	N/A	0.00
Channel Feature:	0.00	Channel Feature:	0.00	Channel Feature:	0.00
run	0.00	pool	0.00	run	0.00
Channel Width:	0.00	Channel Width:	0.00	Channel Width:	0.00
7yards	0.00	4 yards	0.00	7 yards	0.00
0.00	0.00	0.00	0.00	0.00	0.00
Transect 3	0.00	Transect 7	0.00	Transect 11	0.00
Substrate:	0.00	Substrate:	0.00	Substrate:	0.00
bedrock and gravel	0.00	cobbly gravel	0.00	cobbly gravel	0.00
Water Clarity:	0.00	Water Clarity:	0.00	Water Clarity:	0.00
N/A	0.00	N/A	0.00	N/A	0.00
Channel Feature:	0.00	Channel Feature:	0.00	Channel Feature:	0.00
run	0.00	pool	0.00	run	0.00
Channel Width:	0.00	Channel Width:	0.00	Channel Width:	0.00
6 yards	0.00	3 yards	0.00	6 yards	0.00
0.00	0.00	0.00	0.00	0.00	0.00
Transect 4	0.00	Transect 8	0.00	Site Median	Site Maximum
Substrate:	0.00	Substrate:	0.00	0.00	0.00
gravel	0.00	cobbly gravel	0.00		
Water Clarity:	0.00	Water Clarity:	0.00		
N/A	0.00	N/A	0.00		
Channel Feature:	0.00	Channel Feature:	0.00		
riffle	0.00	pool	0.00		
Channel Width:	0.00	Channel Width:	0.00		
5 yards	0.00	6 yards	0.00		
0.00	0.00	0.00	0.00		

Field Data Sheets for Recreational Use Stream Surveys
Data Sheet B - Site Characterization
(must be completed for each site)

WBID 833
 Site # 2

Date and Time: 8.01.07 2:20pm

Current Weather Conditions clear

Weather Conditions for Past 10 days: clear

Drought Conditions? No

Site Location (e.g. road crossing) Hwy W, just outside Linn

GPS Mark: 14

Upstream Photo 17 Downstream Photo 16

Uses Observed (Uses actually observed at time of survey) Circle

Swimming	Skin Diving	SCUBA diving	Tubing
Water Skiing	Wind Surfing	Kayaking	Boating
Wading	Rafting	Hunting	Trapping
Fishing	<u>None of the Above</u>	Other	

Surrounding Conditions

City/county parks	Playgrounds	MDC conservation lands	Urban areas
Campgrounds	Boating accesses	State parks	National Forests
Nature trails	Stairs/walkway	No trespass sign	Fence
Steep slopes	<u>None of the Above</u>	Other	

Indications of Human Use

Roads	Rope swings	Foot paths/prints	Dock/platform
Livestock Watering	RV/ATV Tracks	Camping Sites	Fire pit/ring
NPDES Discharge	Fishing Tackle	Other:	

WBID # 833 **Site #** 2
Mark # 14 **Dissolved Oxygen (ppm)** 12.4
Upstream Views Physical Dimensions: Is there any water present at this view? yes

If so, is there an obvious current? no

Select one of the following channel features:

	% of Channel Feature				
Riffle	36				
Run	0				
Pool	64				

Downstream View's Physical Dimensions: Is there any water present at this view? yes

If so, is there an obvious current? no

Substrate:

59% Cobble	41% Gravel	% Sand	% Silt
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% Mud/Clay	% Bedrock
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Aquatic Vegetation: (Note amount of vegetation or algal growth at the assessment site)

algae on substrate

Water Characteristics

Odor	Sewage	Musky	Chemical	<u>None</u>	Other
Color	<u>Clear</u>	<u>Green</u>	Gray	Milky	Other
Bottom Deposit	Sludge	Solids	<u>Fine Sed.</u>	None	Other
Surface Deposit	<u>Oil</u>	Scum	Foam	None	Other

Data Sheet C: Cross-Sectional Depth Measurements (for estimation of median depth)
(Median Depth Shown in Bold)

Site # 2

Mark # 14

WBID# 833

	Depth (m)
Transect 1	0.10
Substrate:	0.05
cobbly gravel	0.15
Water Clarity:	0.20
clear	0.30
Channel Feature:	0.35
pool	0.40
Channel Width:	0.40
13 yards	0.50
0.33	0.35
Transect 2	0.25
Substrate:	0.30
cobbly gravel	0.45
Water Clarity:	0.45
none	0.45
Channel Feature:	0.55
pool	0.45
Channel Width:	0.50
11 yards	0.50
0.45	0.30
Transect 3	0.15
Substrate:	0.10
cobbly gravel	0.15
Water Clarity:	0.20
clear	0.20
Channel Feature:	0.25
pool	0.20
Channel Width:	0.15
10 yards	0.20
0.20	0.20
Transect 4	0.15
Substrate:	0.15
cobbly gravel	0.15
Water Clarity:	0.15
clear	0.10
Channel Feature:	0.10
pool	0.15
Channel Width:	0.10
11 yards	0.15
0.15	0.15

	Depth (m)
Transect 5	0.05
Substrate:	0.10
gravel	0.20
Water Clarity:	0.30
clear	0.35
Channel Feature:	0.45
pool	0.50
Channel Width:	0.50
11 yards	0.40
0.35	0.35
Transect 6	0.10
Substrate:	0.15
cobbly gravel	0.15
Water Clarity:	0.15
clear	0.10
Channel Feature:	0.10
pool	0.10
Channel Width:	0.10
6 yards	0.10
0.10	0.10
Transect 7	0.05
Substrate:	0.05
cobble	0.05
Water Clarity:	0.05
clear	0.05
Channel Feature:	0.00
rifle	0.00
Channel Width:	0.05
7 yards	0.05
0.05	0.05
Transect 8	0.05
Substrate:	0.05
cobbly gravel	0.10
Water Clarity:	0.10
clear	0.05
Channel Feature:	0.05
rifle	0.05
Channel Width:	0.00
6 yards	0.00
0.05	0.00

	Depth (m)
Transect 9	0.05
Substrate:	0.10
cobbly gravel	0.10
Water Clarity:	0.15
clear	0.10
Channel Feature:	0.15
pool	0.10
Channel Width:	0.05
7 yards	0.05
0.10	0.10
Transect 10	0.05
Substrate:	0.05
cobble	0.05
Water Clarity:	0.05
clear	0.05
Channel Feature:	0.00
pool	0.05
Channel Width:	0.05
7 yards	0.05
0.05	0.05
Transect 11	0.00
Substrate:	0.00
cobble	0.00
Water Clarity:	0.05
clear	0.05
Channel Feature:	0.05
rifle	0.05
Channel Width:	0.00
4 yards	0.05
0.03	0.00
Site Median	Site Maximum
0.10	0.55

Field Data Sheets for Recreational Use Stream Surveys
Data Sheet B - Site Characterization
(must be completed for each site)

WBID 833
 Site # 3

Date and Time: 8.01.07 3:40pm

Current Weather Conditions partly cloudy

Weather Conditions for Past 10 days: clear

Drought Conditions? No

Site Location (e.g. road crossing) County Rd 421

GPS Mark: 15

Upstream Photo 19 Downstream Photo 18

Uses Observed (Uses actually observed at time of survey) Circle

Swimming	Skin Diving	SCUBA diving	Tubing
Water Skiing	Wind Surfing	Kayaking	Boating
Wading	Rafting	Hunting	Trapping
Fishing	<u>None of the Above</u>	Other	

Surrounding Conditions

City/county parks	Playgrounds	MDC conservation lands	Urban areas
Campgrounds	Boating accesses	State parks	National Forests
Nature trails	Stairs/walkway	No trespass sign	Fence
Steep slopes	<u>None of the Above</u>	Other	

Indications of Human Use

Roads	Rope swings	Foot paths/prints	Dock/platform
Livestock Watering	RV/ATV Tracks	Camping Sites	Fire pit/ring
NPDES Discharge	Fishing Tackle	Other:	

WBID # 833 **Site #** 3
Mark # 15 **Dissolved Oxygen (ppm)** 10.4
Upstream Views Physical Dimensions: Is there any water present at this view? yes
 If so, is there an obvious current? no

Select one of the following channel features:

	% of Channel Feature				
Riffle					
Run					
Pool	100				

Downstream View's Physical Dimensions: Is there any water present at this view? yes
 If so, is there an obvious current? no

Substrate:

68% Cobble	14% Gravel	% Sand	% Silt
% Mud/Clay	18% Bedrock		

Aquatic Vegetation: (Note amount of vegetation or algal growth at the assessment site)

none

Water Characteristics

Odor	Sewage	Musky	Chemical	<u>None</u>	Other
Color	Clear	<u>Green</u>	Gray	Milky	<u>Other</u> <u>cloudy</u>
Bottom Deposit	Sludge	Solids	<u>Fine Sed.</u>	None	Other
Surface Deposit	<u>Oil</u>	Scum	Foam	None	Other

Data Sheet C: Cross-Sectional Depth Measurements (for estimation of median depth)
(Median Depth Shown in Bold)

Site # 3

Mark # 15

WBID# 833

	Depth (m)
Transect 1	0.15
Substrate:	0.05
bedrock	0.10
Water Clarity:	0.15
some	0.15
Channel Feature:	0.10
pool	0.10
Channel Width:	0.15
13 yards	0.20
0.15	0.25
Transect 2	0.05
Substrate:	0.00
bedrock	0.05
Water Clarity:	0.00
clear	0.05
Channel Feature:	0.05
pool	0.05
Channel Width:	0.00
4 yards	0.05
0.05	0.05
Transect 3	0.00
Substrate:	0.00
cobble	0.00
Water Clarity:	0.00
N/A	0.00
Channel Feature:	0.00
N/A	0.00
Channel Width:	0.00
4 yards	0.00
0.00	0.00
Transect 4	0.00
Substrate:	0.00
cobble	0.00
Water Clarity:	0.00
N/A	0.00
Channel Feature:	0.00
N/A	0.00
Channel Width:	0.00
4 yards	0.00
0.00	0.00

	Depth (m)
Transect 5	0.00
Substrate:	0.00
cobbly gravel	0.00
Water Clarity:	0.00
N/A	0.00
Channel Feature:	0.00
N/A	0.00
Channel Width:	0.00
5 yards	0.00
0.00	0.00
Transect 6	0.05
Substrate:	0.05
cobbly gravel	0.10
Water Clarity:	0.10
none	0.10
Channel Feature:	0.20
pool	0.25
Channel Width:	0.25
8 yards	0.30
0.15	0.20
Transect 7	0.00
Substrate:	0.00
cobble	0.00
Water Clarity:	0.00
N/A	0.00
Channel Feature:	0.00
N/A	0.05
Channel Width:	0.00
4 yards	0.00
0.00	0.00
Transect 8	0.00
Substrate:	0.00
cobble	0.00
Water Clarity:	0.00
N/A	0.00
Channel Feature:	0.00
N/A	0.00
Channel Width:	0.00
6 yards	0.00
0.00	0.00

	Depth (m)
Transect 9	0.00
Substrate:	0.00
cobble	0.00
Water Clarity:	0.00
N/A	0.00
Channel Feature:	0.00
N/A	0.00
Channel Width:	0.00
4 yards	0.00
0.00	0.00
Transect 10	0.10
Substrate:	0.15
cobble	0.20
Water Clarity:	0.20
none	0.30
Channel Feature:	0.30
pool	0.30
Channel Width:	0.25
8 yards	0.20
0.20	0.10
Transect 11	0.10
Substrate:	0.25
cobbly gravel	0.35
Water Clarity:	0.40
none	0.50
Channel Feature:	0.50
pool	0.50
Channel Width:	0.40
9 yards	0.30
0.38	0.20
Site Median	Site Maximum
0.00	0.50

Field Data Sheets for Recreational Use Stream Surveys
Data Sheet B - Site Characterization
(must be completed for each site)

WBID 833
 Site # 4

Date and Time: 8.01.07 4:15pm

Current Weather Conditions partly cloudy

Weather Conditions for Past 10 days: clear

Drought Conditions? No

Site Location (e.g. road crossing) County Road 423/424

GPS Mark: 16

Upstream Photo 21 Downstream Photo 20

Uses Observed (Uses actually observed at time of survey) Circle

Swimming	Skin Diving	SCUBA diving	Tubing
Water Skiing	Wind Surfing	Kayaking	Boating
Wading	Rafting	Hunting	Trapping
Fishing	<u>None of the Above</u>	Other	

Surrounding Conditions

City/county parks	Playgrounds	MDC conservation lands	Urban areas
Campgrounds	Boating accesses	State parks	National Forests
Nature trails	Stairs/walkway	No trespass sign	Fence
Steep slopes	<u>None of the Above</u>	Other	

Indications of Human Use

Roads	Rope swings	Foot paths/prints	Dock/platform
Livestock Watering	RV/ATV Tracks	Camping Sites	Fire pit/ring
NPDES Discharge	Fishing Tackle	Other:	

WBID # 833 **Site #** 4
Mark # 16 **Dissolved Oxygen (ppm)** 10.1
Upstream Views Physical Dimensions: Is there any water present at this view? yes

If so, is there an obvious current? no

Select one of the following channel features:

	% of Channel Feature				
Riffle					
Run					
Pool	100				

Downstream View's Physical Dimensions: Is there any water present at this view? yes

If so, is there an obvious current? no

Substrate:

9% Cobble	91% Gravel	% Sand	% Silt
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% Mud/Clay	% Bedrock
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Aquatic Vegetation: (Note amount of vegetation or algal growth at the assessment site)

algae on substrate and surface, 80%

Water Characteristics

Odor	Sewage	Musky	Chemical	<u>None</u>	Other
Color	Clear	<u>Green</u>	Gray	Milky	Other
Bottom Deposit	Sludge	Solids	<u>Fine Sed.</u>	None	Other
Surface Deposit	Oil	Scum	Foam	<u>None</u>	Other

Data Sheet C: Cross-Sectional Depth Measurements (for estimation of median depth)
(Median Depth Shown in Bold)

Site # 4

Mark # 16

WBID# 833

	Depth (m)
Transect 1	0.05
Substrate:	0.20
cobble	0.20
Water Clarity:	0.25
clear	0.55
Channel Feature:	0.70
pool	0.75
Channel Width:	0.45
8 yards	0.65
0.50	0.65
Transect 2	0.20
Substrate:	0.40
gravel	0.60
Water Clarity:	0.50
some	0.45
Channel Feature:	0.25
pool	0.20
Channel Width:	0.50
18 yards	0.90
0.48	0.80
Transect 3	0.35
Substrate:	1.00
gravel	1.00
Water Clarity:	1.00
none	1.00
Channel Feature:	1.00
pool	0.80
Channel Width:	0.55
20 yards	0.30
0.90	0.25
Transect 4	0.15
Substrate:	0.35
gravel	0.60
Water Clarity:	0.90
none	1.00
Channel Feature:	1.00
pool	0.95
Channel Width:	0.75
13 yards	0.50
0.68	0.30

	Depth (m)
Transect 5	0.25
Substrate:	0.40
gravel	0.50
Water Clarity:	0.55
clear	0.40
Channel Feature:	0.40
pool	0.40
Channel Width:	0.25
10 yards	0.15
0.40	0.05
Transect 6	0.05
Substrate:	0.10
gravel	0.10
Water Clarity:	0.10
clear	0.15
Channel Feature:	1.00
pool	0.05
Channel Width:	0.05
6 yards	0.00
0.08	0.00
Transect 7	0.00
Substrate:	0.00
gravel	0.00
Water Clarity:	0.00
N/A	0.00
Channel Feature:	0.00
N/A	0.00
Channel Width:	0.00
3 yards	0.00
0.00	0.00
Transect 8	0.00
Substrate:	0.00
gravel	0.00
Water Clarity:	0.00
N/A	0.00
Channel Feature:	0.00
N/A	0.00
Channel Width:	0.00
5 yards	0.00
0.00	0.00

	Depth (m)
Transect 9	0.10
Substrate:	0.30
gravel	0.55
Water Clarity:	0.65
clear	0.70
Channel Feature:	0.70
pool	0.65
Channel Width:	0.50
12 yards	0.35
0.53	0.15
Transect 10	0.15
Substrate:	0.55
gravel	0.75
Water Clarity:	0.90
clear	1.00
Channel Feature:	1.00
pool	1.00
Channel Width:	0.95
13.00	0.95
0.93	0.50
Transect 11	0.10
Substrate:	0.10
gravel	0.30
Water Clarity:	0.40
clear	0.50
Channel Feature:	0.60
pool	0.70
Channel Width:	0.80
9.00	0.50
0.45	0.30
Site Median	Site Maximum
0.38	1.00

WBID# 0833 Linn Creek



Site# 1 Photo ID# 14, Upstream



Site# 1 Photo ID# 15, Downstream



Site#2 Photo ID# 17, Upstream



Site# 2 Photo ID# 16, Downstream

WBID# 0833 Linn Creek



Site# 3 Photo ID# 19, Upstream



Site# 3 Photo ID# 18, Downstream



Site#4 Photo ID# 21, Upstream



Site# 4 Photo ID# 20, Downstream